

Internal Combustion Engines Ski Resorts

&
Operational Requirements

Presented by:
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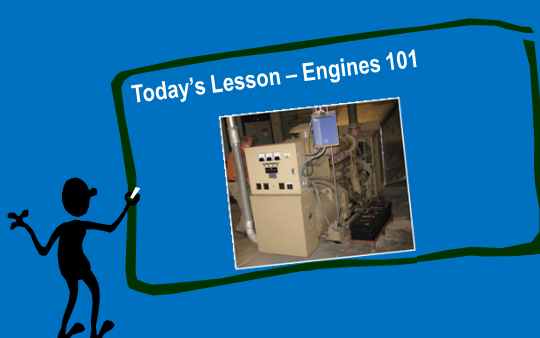

Source: NH Ski Web Page & March 11, 2018 Barry Burbank, WBZ-TV Meteorologist



Why Are We Here Today?


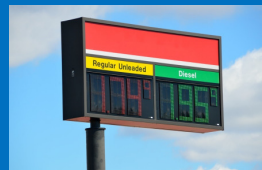
- Review definitions
 - What is an Engine?
 - Mobile Source vs. Stationary Source
 - Prime Power vs. Emergency Power
- State and Federal Air Permitting Regulations
 - General State Permit (Emergency Engines)
 - NH State Air Permit (Prime and Emergency Engines)
- NH Site Visit Findings

Today's Lesson – Engines 101

Internal Combustion Engines

- Liquid Fuels: gasoline, diesel, #2 fuel oil, kerosene, bio-fuel
- Gas Fuels:
 - natural gas, propane, landfill gas

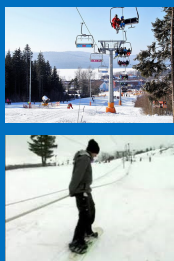



Applies to Any Use

Aerial Lifts



Surface Lifts



Electric Power



Snowmaking



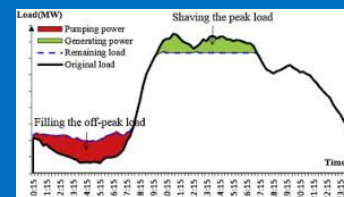
Applies to Either Seasonal- or Year- Round Use



State and Federal Air Rules Do not Apply to Mobile Sources



This Presentation Does not Cover Engines Used for Load Shaving, Peaking Use, Contracts, etc.



Air Regulations



Portable or Transportable Engines

An engine that is moved and used at various locations around the property, or is trailered for use off-site.



Portable or Transportable



Image shown may not reflect actual package.



Portable/Transportable vs. Stationary

Stationary Litmus Test:

If it remains at the property in the same place for more than 12 consecutive months

Or

If it remains in the same place at a seasonal source during the full operating period

It is now a stationary source

Is This a Mobile Source?



Yankee Ingenuity!
Clearly Not Portable



When Was This Last Moved?



Swapping or Replacing an Engine Does
Not Count Towards
Portable/Transportable Status



Replace



Portable/Transportable

- Portable/transportable) engines do not require an air permit from NHDES
- Important to keep accurate records as to the location and use of your mobile sources

When is the Engine Used?

1. In an Emergency
2. As Prime Power



NH Definition of Emergency

"Emergency" means an **unforeseeable condition** that is beyond the control of the owner or operator... that:

- (a) Results in an **interruption of electrical power** from the electricity supplier to the premises;
- (b) Requires an interruption of electrical power from the electricity supplier to the premises in order to enable the owner or operator to repair damage **from fire, flood, or any other catastrophic event**, natural or man-made; or
- (c) Requires operation of an emergency generator to minimize damage from fire, flood, **or any other catastrophic event**, natural or man-made.

Permitting Emergency Engines

In NH - GSP – General State Permit

- Emergency Engines
 - Auxiliary Power Units for lifts
- Used for loss of power, not in place of a broken engine.
- Engine size/horsepower matters
- Valid for 5 years, need to renew, pay fee.

Prime Power

An engine used to supply mechanical or electrical power to your operations when an emergency condition does not exist.

Requires a NH State Air Permit



Summary

- Inventory Your Engines
 1. Prime or emergency?
 2. Portable or stationary?
- Locate, understand, and follow your state's air permit



Questions?



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Federal Regulations

- ✓ 40 CFR 60, Subpart IIII, Standards of Performance for Stationary [Compression Ignition](#) Internal Combustion Engines
- ✓ 40 CFR 60, Subpart JJJJ, Standards of Performance for Stationary [Spark Ignition](#) Internal Combustion Engines
- ✓ 40 CFR 63, Subpart ZZZZ, National [Emission Standards](#) for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (Prior to June 2006)

EPA Regulations, Cont.

- Establishes Emission Standards
- Specific requirements based on engine design, horsepower, and year of manufacture
- Establishes Operation and Maintenance requirements
- Can Include Engines Down to 25 HP

EPA Regulations, Cont.

Quad Z Engines (prior to June 2006)

For emergency use, unlimited hours (federal rule).
In addition to this, for non-emergency use; up to 100 hours of normal maintenance and safety testing. Included in the 100 hours is an allowance for up to 50 hours of non-emergency use.

requires specific maintenance, tune up, and recordkeeping

Your States' Requirements?

- ✓ May or may not have delegation of EPA Regs
- ✓ State can have additional regulations and permitting requirements

New Hampshire Regulations

New Hampshire Has Delegation of EPA 40 CFR 60 and 40 CFR 63 and has established permitting requirements.

NH will issue you a Permit based on your needs:

1. General State Permit (GSP) - is for Emergency Use, Maintenance, and Testing
2. State Permit to Operate (SP) - is for either:
 - a. Emergency Use with an additional 50-hours of Non-Emergency Use, or
 - b. Prime Power Use

New Hampshire Findings

Emergency Engines Were Used as Prime Power for Lift Serve

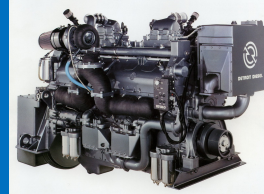
Engines are Used as Auxiliary Power for Lift Emergency Evac
Mechanical Power
Electrical Generation

Some Engines Used in Snowmaking to Operations
Air Compressor
Water Pump

Some Engines Used to Generate Electrical Power
Buildings
Maintenance Work

Size of Engine That Requires a Permit

Any Single Engine with Heat Input of:



Fuel Oils
Heat Input = 1.5 MMBtu/hr

Gaseous Fuel
Heat Input = 10 MMBtu/hr

Permit Required?

- Gaseous fuel (i.e. propane) engines

Heat Input =
10 MMBtu/hr



Heat Output =
1,500 hp (1,200 kW)

Example Using CI (Diesel) Engine

Also Cumulative Heat Input = 1.5 MMBtu/hr
(for any engine @ 0.15 MMBtu/hr or greater)

1.3 MMBtu/hr



0.5 MMBtu/hr



0.15 MMBtu/hr



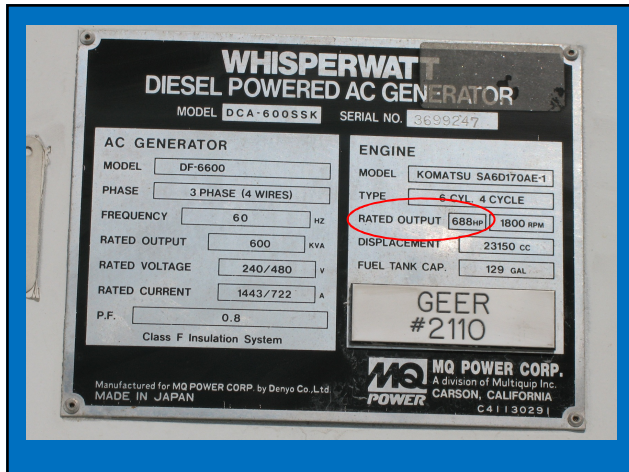
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1.95 MMBtu/hr

*Now requires a State Permit to operate



Record Keeping

- Review your permit
 - Keep track of hours used
 - Emergency
 - Maintenance
 - Testing
- Verify the engines match between your facility and the permit
- Operating Plans
 - Manufacturing Guidelines
 - How engines are actually used and maintained
 - For each engine

Permit Language

Emergency Engines

- Each emergency engine subject to 40 CFR 63 Subpart ZZZZ, with the exception of up to 50 hours of non-emergency use per consecutive 12-month period, shall only operate:
 - a. As a mechanical or electrical power source during an emergency which is detailed below, as an unforeseeable condition that is beyond the control of the owner or operator that:
 1. Requires electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.;
 2. Requires an interruption of electrical power from the electricity supplier to the premises in order to enable the owner or operator to repair damage from fire, flood, or any other catastrophic event, natural or man-made;
 3. Requires operation of an emergency generator to minimize damage from fire, flood, or any other catastrophic event, natural or man-made;
 - or
 - b. During scheduled maintenance checks and readiness testing, as recommended by federal, state or local government, the manufacturer, the vendor or the insurance company associated with the engine, for a maximum of 100 hours per calendar year.

Permit Language Cont.

40 CFR 63 Subpart ZZZZ

- Engine Operating Requirements
- The emergency engines shall be operated as follows:
 - a. Change oil and filter annually;
 - b. Inspect air cleaner annually and replace as necessary;
 - c. Inspect all hoses and belts annually and replace as necessary;
 - d. Operate and maintain the stationary engine according to the manufacturer's emission-related written instructions (O&M manual) or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions; and
 - e. Minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes

Permit Language Cont.

- General Recordkeeping Requirements for Combustion Devices
- Maintain the following records of fuel characteristics and utilization for the fuel used in the combustion devices:
 - a. Type (e.g. gasoline, ULSD) of fuel burned in each combustion device;
 - b. Amount of the fuel burned in each combustion device;
 - c. Hours of operation of each device; and
 - d. Documentation that the fuel meets sulfur limits.

Permit Language Cont.

- Additional Recordkeeping Requirements for Engines Subject to NSPS and NESHAP Regulations
- The owner or operator shall maintain the following records:
 - a. The maintenance conducted on each engine in order to demonstrate that the device was operated and maintained according to the O&M manual;
 - b. The operation of the engine in emergency (i.e. loss of power) and non-emergency situations (i.e. maintenance and testing) that are recorded through the non-resettable hour meter. The owner or operator must record the time of operation of the engine and the reason the engine was in operation during that time; and
 - c. Documentation of the federal, state or local standard(s) that require the owner or operator to conduct maintenance and testing for more than 100 hours per calendar year if the owner or operator is exercising the option listed in Footnote 6.

Don't Forget About Your Fuel Storage Tank

Single tank > 660 gallons
Multiple tanks > 1,320 gallons

Registration and installation requirements through Waste Management Division

Contact Aboveground Storage Tank Program at (603) 271-3899



Technical Assistance



- OneStop
 - Review your air permit and other DES registrations, permits, applications
 - <http://www4.des.state.nh.us/DESONestop/BasicSearch.aspx>
- Air E-Permitting
 - Apply for General State Permit/Emergency Engines
 - <https://www.des.nh.gov/onestop/air-epermitting.htm>

E-News

- DES newsletters and announcements
 - Proposed Rules
 - Water, Waste, Air, and more
- Air Permitting Contact
 - Emails on time to renew your permit
 - Keep up to date



Contact Information

NH State Operating Permit

Barbara Dorfschmidt – (603) 271-6796

Barbara.Dorfschmidt@des.nh.gov

General State Permit for Emergency Engines

Anne Bailey – (603) 271-6828

anne.bailey@des.nh.gov



Summary

- Know Your Permit
- Follow Guidelines in Your Permit
- Use OneStop, E-News to Stay Up to Date

QUESTIONS?

Handouts provided to detail information for quick discussion.

Direct them to review in detail.

Direct them to visit EPA's Web Site and Engine Determination Portal